

## **ABSTRACT OF THE DISCLOSURE**

A 4-stroke engine incorporating a mono-shaft multi-valve operating system, the multi-valve operating system incorporating a first cam follower assembly that is associated with an intake valve, a second cam follower assembly that is associated with an exhaust valve, and a cam follower channel assembly that is integrated into a crank web of the engine, the cam follower channel assembly including a base circle channel, a cam channel, and a cross-over channel. The cam follower channel assembly is configured to commonly interact with the two cam follower assemblies to operate the intake valve at a first instance, and the exhaust valve at a second instance, with both instances occurring while the crank web completes two rotations. When either of the two cam follower assemblies engages with a cam channel of the cam follower channel assembly, the cam follower channel assembly is configured to provide a camming operation to operate the respective valve. When either of the two cam follower engages a base circle channel of the cam follower channel assembly, the cam follower channel assembly is configured to prevent operation of the respective valve.